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(51) INT CL<sup>7</sup>  
**A42B 3/28 3/14**

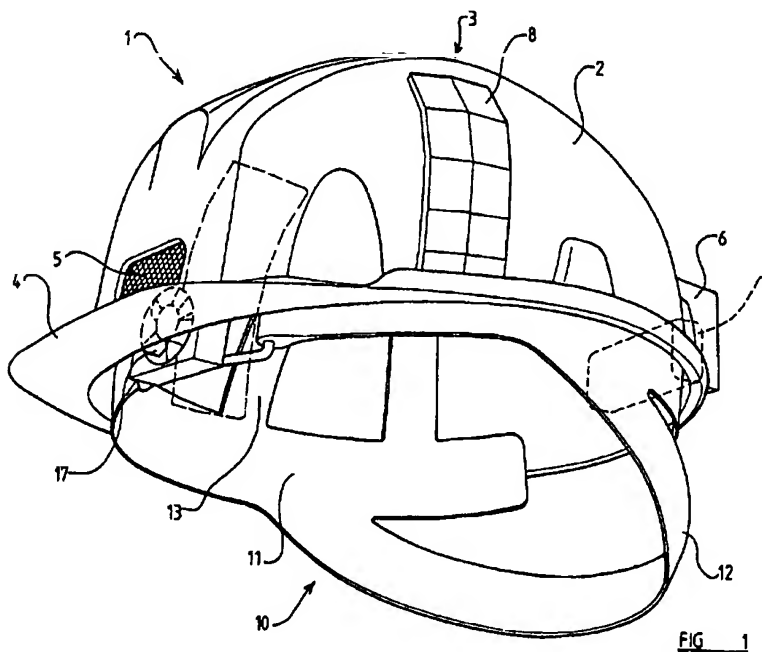
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(56) Documents Cited  
**GB 1528476 A EP 0365433 A1 US 6321416 A**  
**US 4893356 A US 4888831 A**

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**UK CL (Edition R ) A3V**  
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(54) Abstract Title  
**Hard hat with optional cooling fan**

(57) Hard hat (1) comprises an internal strap arrangement (10) which incorporates a bridge element (14, fig 2) located so that it is spaced away from the forehead of the wearer. A fan (17) may be mounted on the bridge element which may be powered by a rechargeable battery (7) in conjunction with solar panel (8), it may also be provided with means for speed adjustment. An air filter (9) may be mounted in opening (5) of the hat.



**GB 2 347 339 A**

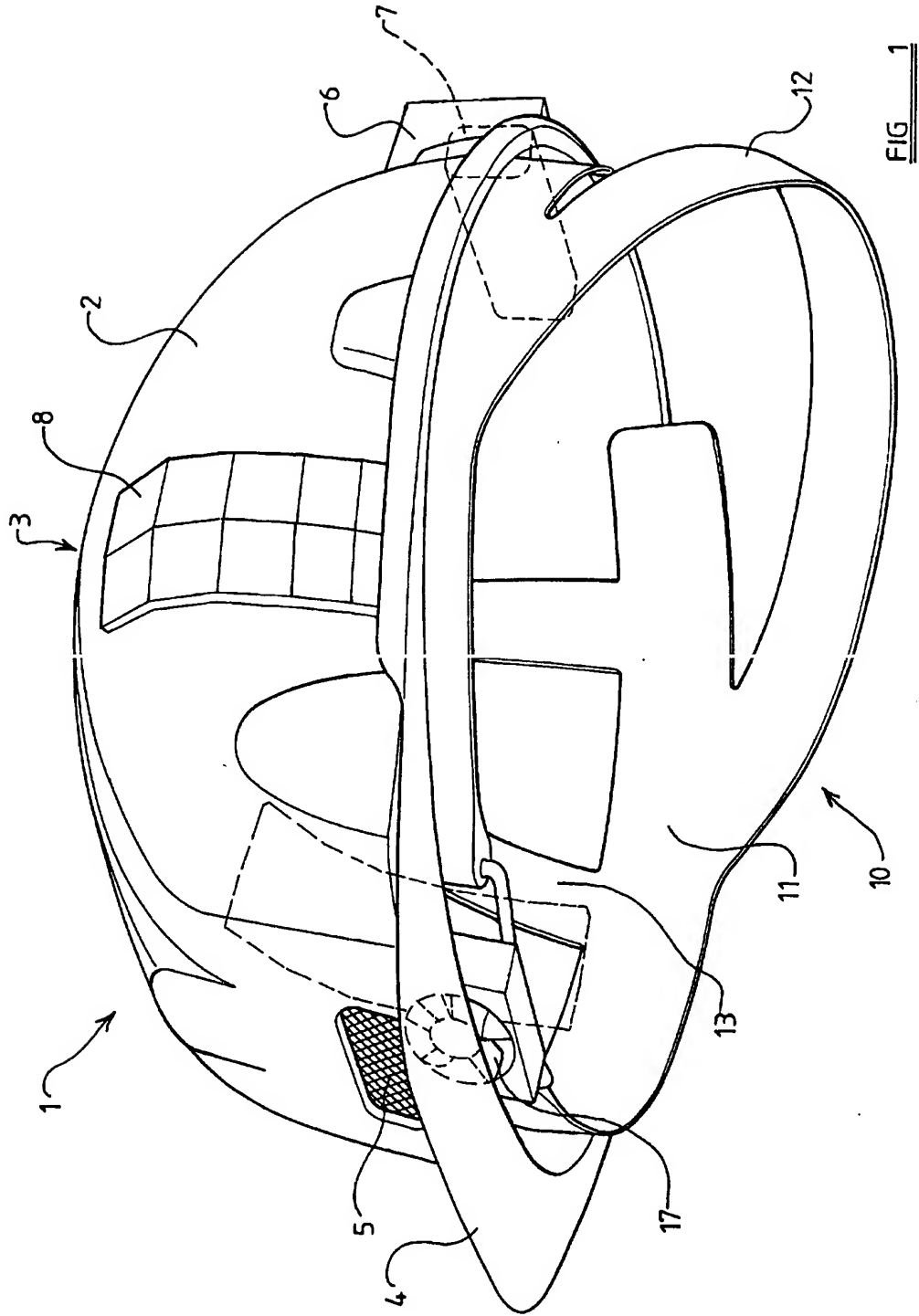
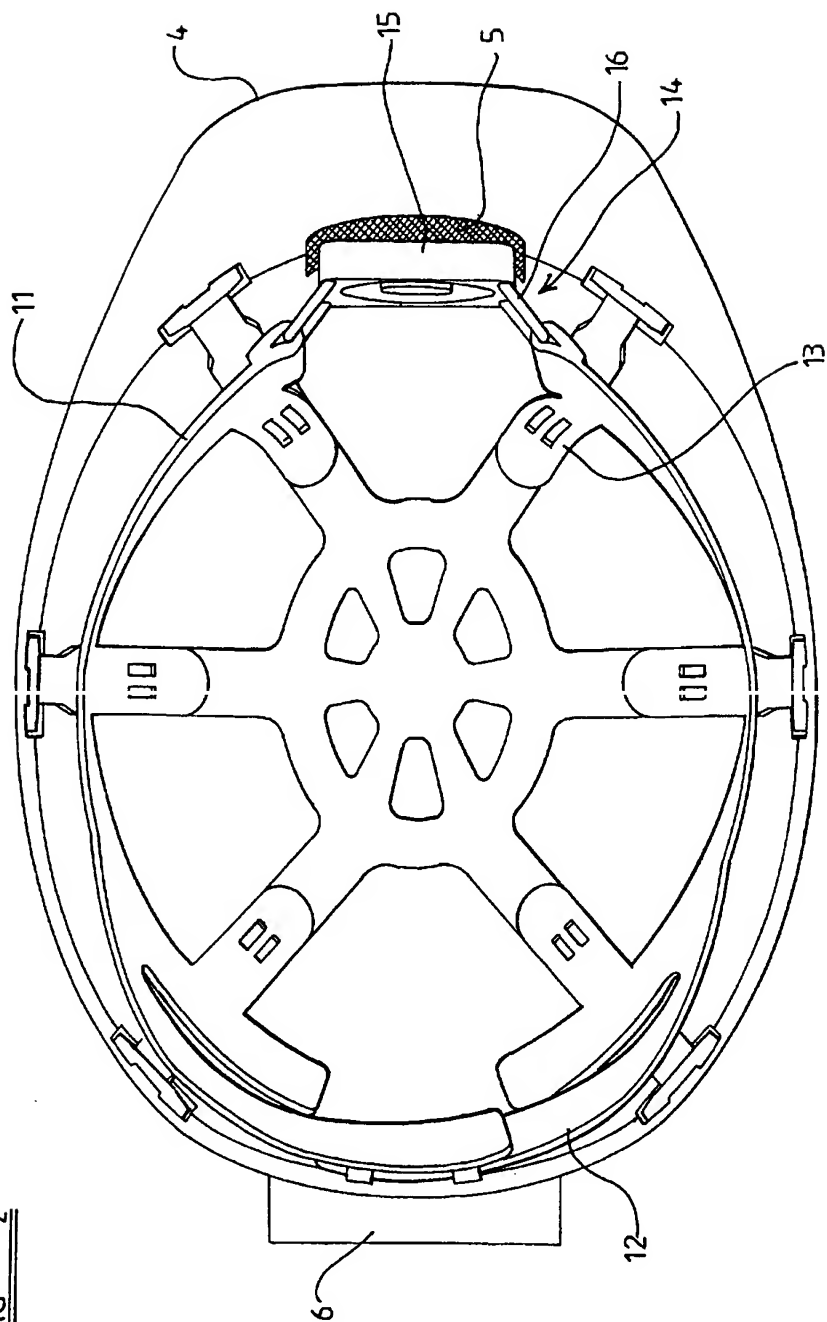


FIG 2



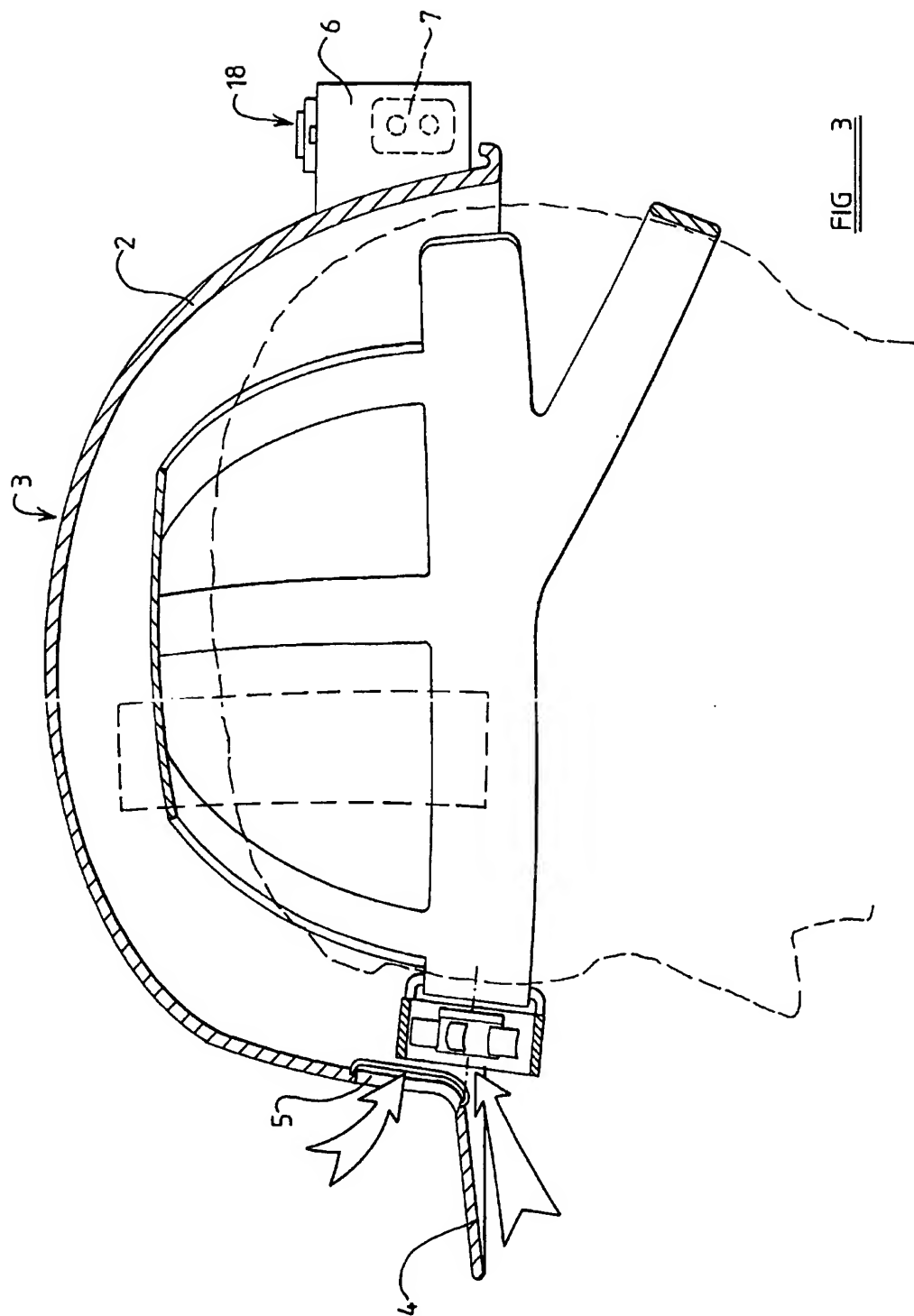
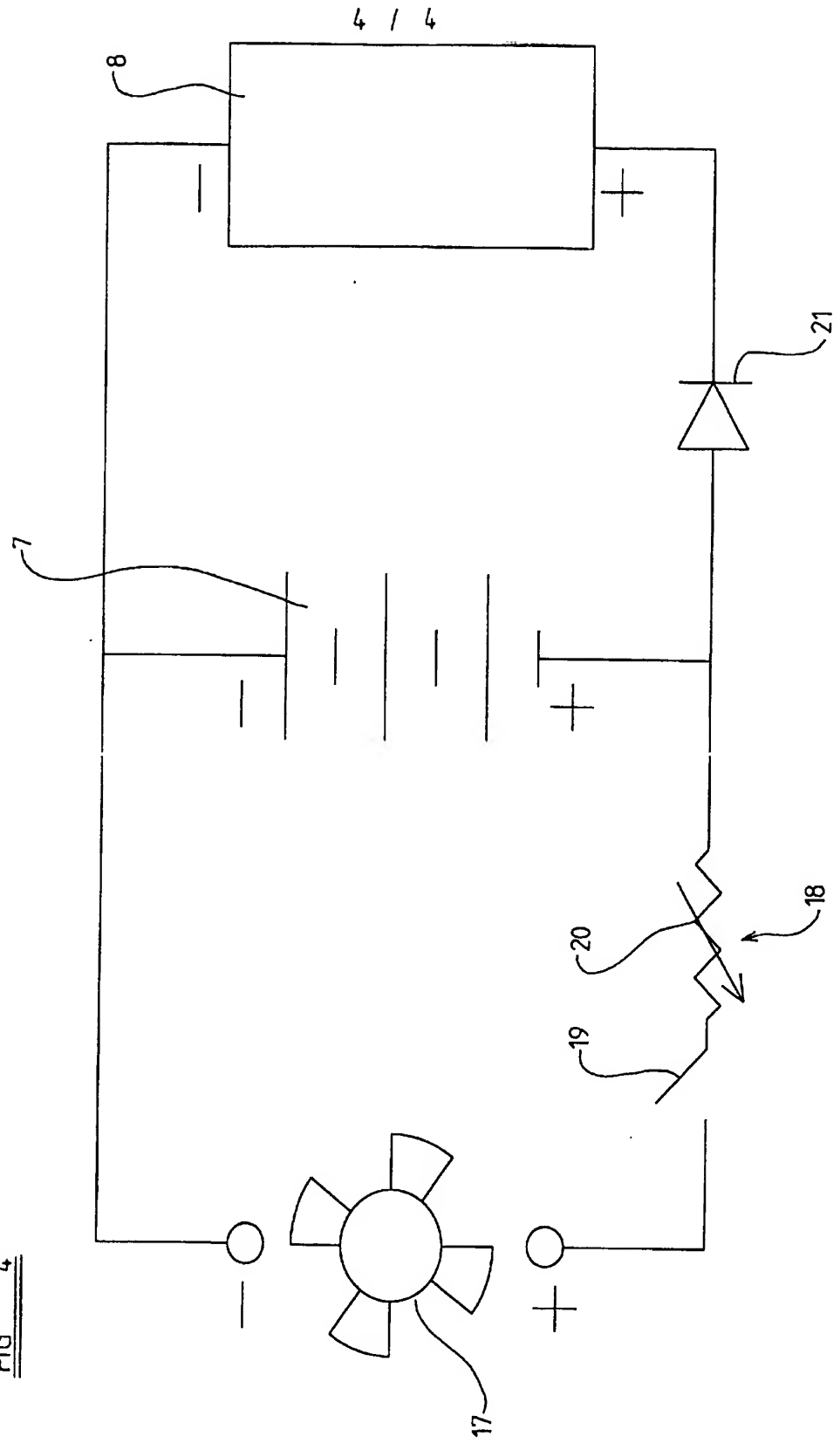


FIG 3

FIG 4



## DESCRIPTION OF INVENTION

### **"IMPROVEMENTS IN OR RELATING TO AN ITEM OF HEADGEAR"**

**THE PRESENT INVENTION** relates to an item of headgear, and relates more particularly to an item of headgear which incorporates an internal strap by means of which the headgear is mounted on the head of the person wearing the headgear.

Various items of headgear, including, in particular "hard hats" as used by the builders and the like, incorporate an internal strap, typically formed of a plastic material, by means of which the headgear is mounted on the head.

This strap, when viewed from the interior of the item of headgear, is usually of generally oval form, and may incorporate an adjustable element so that the overall size of the oval form may be adjusted. The strap, of oval form, engages the head of the person wearing the item of headgear.

If the person wearing the item of headgear is operating in a hot environment, or is, for example, performing physical labour, the presence of a strap of plastics material encircling their head may prove to be uncomfortable and inconvenient.

The present invention seeks to provide an improved item of headgear.

According to this invention there is provided an item of headgear, said item of headgear comprising a substantially rigid outer shell, and an internal strap arrangement by means of which the shell is mounted on the head of a person to wear the item of headgear, the strap arrangement comprising an arrangement which, when viewed from the interior of the hat, is substantially oval, part of the strap arrangement positioned to be located adjacent the forehead of the person wearing the headgear comprising a bridge element which extends out of the line of the oval defined by the straps so that, in use, a substantial part of the bridge element is spaced away from the forehead of the person wearing the item of headgear.

Preferably the bridge element incorporates a fan, the fan being operable to direct air towards the forehead of the person wearing the item of headgear.

Conveniently a battery is mounted on the item of headgear to power the fan, the item of headgear also being provided with light-responsive electricity generating means mounted on the exterior of the item of headgear, connected to recharge the battery.

Advantageously the light-responsive electricity generating means comprise a solar panel.

Preferably means are provided to adjust the speed of the fan.

Conveniently the fan is located to draw air into the item of headgear through an aperture formed in the substantially rigid shell, filter means being associated with the aperture.

In order that the invention may be more readily understood, and so that further features thereof may be appreciated, the invention will now be described, by way of example, with reference to the accompanying drawings in which:

FIGURE 1 is a perspective of an item of headgear in accordance with the invention,

FIGURE 2 is a view showing the front part of the item of headgear shown in Figure 1 viewed from beneath,

FIGURE 3 is a side view shown partly in section illustrating the item of headgear in use, and

FIGURE 4 is a circuit diagram.

Referring initially to Figures 1 and 2 of the accompanying drawings, an item of headgear in the form of a hard hat 1 comprises a substantially rigid shell 2 which may be formed of a moulded plastics material or a laminated fibreglass material, as is conventional.

The shell 2 is provided with an upstanding dome-shaped central region 3 provided with a forwardly extending peak 4. Adjacent the peak 4, an opening 5 is formed in the shell to constitute an air inlet.

The rear of the shell 2 is provided with a housing 6. The housing 6 is intended to contain a battery 7.

Mounted on the opposed sides of the shell of the hat are solar panels 8.



An air filter 9 may be mounted in the opening 5.

Contained within the interior of the shell 2 of the hat is a strap arrangement 10. The strap arrangement incorporates a generally oval strap 11 which incorporates a depending horseshoe-shaped strap element 12 adapted to engage the rear part of the head of the person wearing the hat. The oval strap 11, which incorporates the horseshoe-shaped strap 12, is associated with further internal straps 13 which are connected to the shell of the hat in a conventional manner.

The front part of the oval strap 11, as can be seen most clearly in Figure 2, incorporates a bridge element 14, the bridge element being of non-linear form, and thus extending substantially forwardly of the line of the generally oval strap 11.

It is to be appreciated that the provision of a bridge element, such as the bridge element 14, means that the person wearing the hat is only in contact with the strap arrangement 11 towards the sides and rear of the head, and is not in contact with the strap arrangement in the front of the head, or in the forehead region. Consequently it is envisaged that the item of headgear would be more comfortable to wear than items of headgear proposed heretofore, especially in a hot environment.

In the described embodiment, the bridge element 14 comprises a central housing 15 of generally cuboid form, provided with two angularly extending arms 15,16 which are connected to the strap 11. Contained within the housing 15 is a fan 17 as can be seen in Figure 1. The fan is substantially aligned with the air inlet aperture 5 and associated filter 9 formed in the shell 2 of the described item of headgear.

As can be seen most clearly in Figure 3, a switch 18 is provided which is mounted on the top of the housing 6 so as to be manually operable.

Referring now to Figure 4, the switch 18 incorporates not only an on/off switch 19 but also a rheostat 20, or some other speed regulating device for the fan 17. It is to be appreciated that the switch 18 is in a circuit which incorporates the fan 17 and the battery 7. Thus the switch may be actuated to turn the fan on and to adjust the speed of operation of the fan. The fan will draw air into the hard hat.

Of course, other speed controlling arrangements than a rheostat may be used.

As can also be seen from Figure 4, the solar panel 8 is connected by means of a diode 21 in circuit with the battery 7. It is thus to be appreciated that when light falls on the solar panel 8, the battery 7 will be charged, by the solar panel until a fully charged state exists.

It is to be appreciated that, in the described embodiment of the invention, a filter 9 is associated with the aperture 5 formed in the shell 2 of the hard hat, so that air drawn into the hard hat by the fan 17 will be filtered. It is to be appreciated that because the fan is located just in front of the forehead of the person wearing the hat, air drawn into the hard hat by the fan 17 will provide an excellent cooling effect, tending to make unpleasant conditions much more tolerable.

Whilst the invention has been described with particular reference to a hard hat, it is to be appreciated that the invention may be equally applicable to other items of headgear which are mounted on the head by means of internal straps, such as riding helmets and other types of helmet.

**CLAIMS:**

1. An item of headgear, said item of headgear comprising a substantially rigid outer shell, and an internal strap arrangement by means of which the shell is mounted on the head of a person to wear the item of headgear, the strap arrangement comprising an arrangement which, when viewed from the interior of the hat, is substantially oval, part of the strap arrangement positioned to be located adjacent the forehead of the person wearing the headgear comprising a bridge element which extends out of the line of the oval defined by the straps so that, in use, a substantial part of the bridge element is spaced away from the forehead of the person wearing the item of headgear.
2. An item of headgear according to Claim 1 wherein the bridge element incorporates a fan, the fan being operable to direct air towards the forehead of the person wearing the item of headgear.
3. An item of headgear according to Claim 2 wherein a battery is mounted on the item of headgear to power the fan, the item of headgear also being provided with light-responsive electricity generating means mounted on the exterior of the item of headgear, connected to recharge the battery.
4. An item of headgear according to Claim 3 wherein the light-responsive electricity generating means comprise a solar panel.
5. An item of headgear according to any one of Claims 2 to 4 wherein means are provided to adjust the speed of the fan.

6. An item of headgear according to any one of Claims 2 to 5 wherein the fan is located to draw air into the item of headgear through an aperture formed in the substantially rigid shell, filter means being associated with the aperture.
7. An item of headgear according to any one of the preceding Claims in the form of a hard hat.
8. An item of headgear substantially as herein described with reference to and as shown in the accompanying drawings.



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INVESTOR IN PEOPLE

Application No: GB 9904802.7  
Claims searched: 1-8

8

Examiner: Barnaby Wright  
Date of search: 10 February 2000

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:  
UK CI (Ed.R): A3V  
Int CI (Ed.7): A42B (1/24, 3/04, 3/14, 3/28)  
Other: Online: WPI, EPODOC, JAPIO

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
A	GB 1528476 WATERS See eg page 3, ln 32-38.	-
A	EP 0365433 A1 PARINTER See eg abstract.	-
A	US 5321416 BASSETT See headband arrangement 66.	-
A	US 4893356 WATERS See eg fig 2 .	-
A	US 4888831 OLESON See headband 26.	-

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.